CONTROLLER-PILOT DATA LINK COMMUNICATIONS (CPDLC)

CPDLC-2 MESSAGE SET

1. **Uplink Messages**

1.1 The uplink messages for CPDLC-2 are presented in this section.

Table A-1: Responses/Acknowledgements (uplink)

	Message Intent/Use	Message Element	URG	ALRT	RESP
0	Indicates that ATC cannot comply with the request.	UNABLE	N	M	N
1	Indicates that ATC has received the message and will respond.	STANDBY	N	L	N
3	Indicates that ATC has received and understood the message.	ROGER	N	L	N
4	Yes.	AFFIRM	N	L	N
5	No.	NEGATIVE	N	L	N
211	Indicates that ATC has received the request and has passed it to the next control authority.	REQUEST FORWARDED	N	L	N

Table A-2: Vertical Clearances (uplink)

	Message Intent/Use	Message Element	URG	ALRT	RESP
6	Notification that a level change instruction should be expected.	EXPECT *(level)*	L	L	R
14	Notification that an instruction should be expected for the aircraft to commence climb at the specified position to the specified level.	AT *(position)* EXPECT CLIMB TO *(level)*	L	L	R
16	Notification that an instruction should be expected for the aircraft to commence descent at the specified position to the specified level.	AT *(position)* EXPECT DESCENT TO *(level)*	L	L	R
19	Instruction to maintain the specified level.	MAINTAIN *(level)*	N	M	W/U
20	Instruction that a climb to a specified level is to commence and once reached the specified level is to be maintained.	CLIMB TO *(level)*	N	M	W/U
22	Instruction that at the specified position, a climb to the specified level is to commence and once reached the specified level is to be maintained.	AT *(position)* CLIMB TO *(level)*	N	M	W/U
23	Instruction that a descent to a specified level is to commence and once reached the specified level is to be maintained.	DESCEND TO *(level)*	N	M	W/U

25	Instruction that at the specified position a descent to the specified level is to commence and once reached the specified level is to be maintained.	AT *(position)* DESCEND TO *(level)*	N	M	W/U
26	Instruction that a climb is to commence at a rate such that the specified level is reached at or before the specified time.	CLIMB TO REACH *(level)* BY *(time)*	N	M	W/U
27	Instruction that a climb is to commence at a rate such that the specified level is reached at or before the specified position.	CLIMB TO REACH *(level)* BY *(position)*	N	M	W/U
28	Instruction that a descent is to commence at a rate such that the specified level is reached at or before the specified time.	DESCEND TO REACH *(level)* BY *(time)*	N	M	W/U
29	Instruction that a descent is to commence at a rate such that the specified level is reached at or before the specified position.	DESCEND TO REACH *(level)* BY *(position)*	N	M	W/U
171	Instruction to climb at not less than the specified rate.	CLIMB AT *(vertical rate)* MINIMUM	N	M	W/U
172	Instruction to climb at not above the specified rate.	CLIMB AT *(vertical rate)* MAXIMUM	N	M	W/U
173	Instruction to descend at not less than the specified rate.	DESCEND AT *(vertical rate)* MINIMUM	N	M	W/U
174	Instruction to descend at not above the specified rate.	DESCEND AT *(vertical rate)* MAXIMUM	N	M	W/U

Note. Wherever the variable (level) is specified, the message can specify either a single level or a vertical range, i.e. block level.

Table A-3: Crossing Constraints (uplink)

	Message Intent/Use	**Message Element**	**URG**	**ALRT**	**RESP**
46	Instruction that the specified position is to be crossed at the specified level. This may require the aircraft to modify its climb or descent profile.	CROSS *(position)* AT *(level)*	N	M	W/U
47	Instruction that the specified position is to be crossed at or above the specified level.	CROSS *(position)* AT OR ABOVE *(level)*	N	M	W/U
48	Instruction that the specified position is to be crossed at or below the specified level.	CROSS *(position)* AT OR BELOW *(level)*	N	M	W/U
51	Instruction that the specified position is to be crossed at the specified time.	CROSS *(position)* AT *(time)*	N	M	W/U
52	Instruction that the specified position is to be crossed at or before the	CROSS *(position)* AT OR BEFORE *(time)*	N	M	W/U

	Message Intent/Use	Message Element	URG	ALRT	RESP
	specified time.				

53	Instruction that the specified position is to be crossed at or after the specified time.	CROSS *(position)* AT OR AFTER *(time)*	N	M	W/U
54	Instruction that the specified position is to be crossed at a time between the specified times.	CROSS *(position)* BETWEEN *(time)* AND *(time)*	N	M	W/U
55	Instruction that the specified position is to be crossed at the specified speed and the specified speed is to be maintained until further advised.	CROSS *(position)* AT *(speed)*	N	M	W/U
58	Instruction that the specified position is to be crossed at the specified time and at the specified level.	CROSS [position] AT *(time)* AT *(level)*	N	M	W/U
61	Instruction that the specified position is to be crossed at the specified level and speed and the level and speed are to be maintained.	CROSS *(position)* AT AND MAINTAIN *(level)* AT *(speed)*	N	M	W/U
63	Instruction that at the specified time the specified position is to be crossed at the specified level and speed and the level and speed are to be maintained.	AT *(time)* CROSS *(position)* AT AND MAINTAIN *(level)* AT *(speed)*	N	M	W/U

Note. Wherever the variable (level) is specified, the message can specify either a single level or a vertical range, i.e. block level.

Table A-4: Lateral Offsets (uplink)

	Message Intent/Use	**Message Element**	**URG**	**ALRT**	**RESP**
64	Instruction to fly a parallel track to the cleared route at a displacement of the specified distance in the specified direction.	OFFSET *(specified distance) (direction)* OF ROUTE	N	M	W/U
72	Instruction to resume own navigation following a period of tracking or heading clearances. May be used in conjunction with an instruction on how or where to rejoin the cleared route.	RESUME OWN NAVIGATION	N	M	W/U

Table A-5: Route Modifications (uplink)

	Message Intent/Use	Message Element	URG	ALRT	RESP
73	Notification to the aircraft of the instructions to be followed from departure until the specified clearance limit.	*(departure clearance)*	N	M	W/U
74	Instruction to proceed directly from its present position to the specified position.	PROCEED DIRECT TO *(position)*	N	M	W/U
75	Instruction to proceed, when able, directly to the specified position.	WHEN ABLE PROCEED DIRECT TO *(position)*	N	M	W/U
77	Instruction to proceed, at the specified position, directly to the next specified position.	AT *(position)* PROCEED DIRECT TO *(position)*	N	M	W/U
78	Instruction to proceed, upon reaching the specified level, directly to the specified position.	AT *(level)* PROCEED DIRECT TO *(position)*	N	M	W/U
79	Instruction to proceed to the specified position via the specified route.	CLEARED TO *(position)* VIA *(route clearance)*	N	M	W/U
80	Instruction to proceed via the specified route.	CLEARED *(route clearance)*	N	M	W/U
81	Instruction to proceed in accordance with the specified procedure.	CLEARED *(procedure name)*	N	M	W/U
82	Approval to deviate up to the specified distance from the cleared route in the specified direction.	CLEARED TO DEVIATE UP TO *(specified distance)* *(direction)* OF ROUTE	N	M	W/U
83	Instruction to proceed from the specified position via the specified route.	AT *(position)* CLEARED *(route clearance)*	N	M	W/U
84	Instruction to proceed from the specified position via the specified procedure.	AT *(position)* CLEARED *(procedure name)*	N	M	W/U
85	Notification that a clearance to fly on the specified route may be issued.	EXPECT *(route clearance)*	L	L	R
92	Instruction to enter a holding pattern with the published characteristics at the specified position and level.	HOLD AT *(position)* AS PUBLISHED MAINTAIN *(level)*	N	M	W/U
93	Notification that an onwards clearance may be issued at the specified time.	EXPECT FURTHER CLEARANCE AT *(time)*	L	L	R
190	Instruction to fly on the specified heading.	FLY HEADING *(degrees)*	N	M	W/U
96	Instruction to continue to fly on the current heading.	CONTINUE PRESENT HEADING	N	M	W/U
99	Notification that a clearance may be issued for the aircraft to fly the specified procedure.	EXPECT *(procedure name)*	L	L	R

Note. Wherever the variable (level) is specified, the message can specify either a single level or a vertical range, i.e. block level.

Table A-6: Speed Changes (uplink)

	Message Intent/Use	Message Element	URG	ALRT	RESP
106	Instruction that the specified speed is to be maintained.	MAINTAIN *(speed)*	N	M	W/U
107	Instruction that the present speed is to be maintained.	MAINTAIN PRESENT SPEED	N	M	W/U
108	Instruction that the specified speed or a greater speed is to be maintained.	MAINTAIN *(speed)* OR GREATER	N	M	W/U
109	Instruction that the specified speed or a lesser speed is to be maintained.	MAINTAIN *(speed)* OR LESS	N	M	W/U
115	Instruction that the specified speed is not to be exceeded.	DO NOT EXCEED *(speed)*	N	M	W/U
116	Notification that the aircraft need no longer comply with the previously issued speed restriction.	RESUME NORMAL SPEED	N	M	W/U
222	Notification that the aircraft may keep its preferred speed without restriction.	NO SPEED RESTRICTION	L	L	R

Note. Wherever the variable (level) is specified, the message can specify either a single level or a vertical range, i.e. block level.

Table A-7: Contact/Monitor/Surveillance Requests (uplink)

	Message Intent/Use	Message Element	URG	ALRT	RESP
117	Instruction that the ATS unit with the specified ATS unit name is to be contacted on the specified frequency.	CONTACT *(unit name)* *(frequency)*	N	M	W/U
120	Instruction that the ATS unit with the specified ATS unit name is to be monitored on the specified frequency.	MONITOR *(unit name)* *(frequency)*	N	M	W/U
123	Instruction that the specified code (SSR code) is to be selected.	SQUAWK *(code)*	N	M	W/U
179	Instruction that the `ident' function on the SSR transponder is to be actuated.	SQUAWK IDENT	N	M	W/U

Table A-8: Report/Confirmation Requests (uplink)

	Message Intent/Use	Message Element	URG	ALRT	RESP
128	Instruction to report when the aircraft has left the specified level.	REPORT LEAVING *(level)*	N	L	W/U
200	Instruction used in conjunction with a level clearance to report reaching the level assigned.	REPORT REACHING	N	L	W/U
130	Instruction to report when the aircraft has passed the specified position.	REPORT PASSING *(position)*	N	L	W/U
181	Instruction to report the present distance to or from the specified position.	REPORT DISTANCE *(to/from) (position)*	N	M	Y
228	Instruction to report the estimated time of arrival at the specified position.	REPORT ETA *(position)*	L	L	Y
132	Instruction to report the present position.	REPORT POSITION	N	M	Y
133	Instruction to report the present level.	REPORT PRESENT LEVEL	N	M	Y
134	Instruction to report the requested speed.	REPORT *(speed type) (speed type) (speed type)* SPEED	N	M	Y
135	Instruction to confirm and acknowledge the currently assigned level.	CONFIRM ASSIGNED LEVEL	N	L	Y
231	Instruction to indicate the pilot's preferred level.	STATE PREFERRED LEVEL	L	L	Y
232	Instruction to indicate the pilot's preferred time and/or position to commence descent to the aerodrome of intended arrival.	STATE TOP OF DESCENT	L	L	Y

Note. Wherever the variable (level) is specified, the message can specify either a single level or a vertical range, i.e. block level.

Table A-9: Negotiation Requests (uplink)

	Message Intent/Use	Message Element	URG	ALRT	RESP
148	Request for the earliest time at which the specified level can be accepted.	WHEN CAN YOU ACCEPT *(level)*	N	L	Y
149	Instruction to report whether or not the specified level can be accepted at the specified position.	CAN YOU ACCEPT *(level)* AT *(position)*	N	L	A/N

Note. Wherever the variable (level) is specified, the message can specify either a single level or a vertical range, i.e. block level.

Table A-10: Air Traffic Advisories (uplink)

	Message Intent/Use	Message Element	URG	ALRT	RESP
213	ATS advisory that the specified altimeter setting relates to the specified facility.	*(facility designation)* ALTIMETER *(altimeter)*	N	L	R
157	Notification that a continuous transmission is detected on the specified frequency. Check the microphone button.	CHECK STUCK MICROPHONE *(frequency)*	U	M	N

Table A-11: System Management Messages (uplink)

	Message Intent/Use	Message Element	URG	ALRT	RESP
159	A system generated message notifying that the ground system has detected an error.	ERROR *(error information)*	U	M	N
160	Notification to the avionics that the specified data authority is the Next Data Authority. If no data authority is specified, this indicates that any previously specified Next Data Authority is no longer valid.	NEXT DATA AUTHORITY *(facility)*	L	N	N
162	Notification that the ground system does not support this message.	SERVICE UNAVAILABLE	L	L	N
163	Notification to the pilot of an ATSU identifier.	*(facility designation)*	L	N	N
227	Confirmation to the aircraft system that the ground system has received the message to which the logical acknowledgement refers and found it acceptable for display to the responsible person.	LOGICAL ACKNOWLEDGEMENT	N	M	N
233	Notification to the pilot that messages sent requiring a logical acknowledgement will not be accepted by this ground system.	USE OF LOGICAL ACKNOWLEDGEMENT PROHIBITED	N	M	N

Table A-12: Additional Messages (uplink)

	Message Intent/Use	Message Element	URG	ALRT	RESP
164	The associated instruction may be complied with at any future time.	WHEN READY	L	N	N
165	Used to link two messages, indicating the proper order of execution of clearances/ instructions.	THEN	L	N	N
183		*(free text)*	N	M	N
196		*(free text)*	N	M	W/U
203		*(free text)*	N	M	R
205		*(free text)*	N	M	A/N

Note. ✎ Free text message elements have no associated message intent. The capability to send a free text message with any of the attribute combinations already used in the message set have been provided for in the technical requirements of the ATN (Annex 10, Volume III, Part I, Chapter 3).

2. Downlink Messages

2.1 The downlink messages for CPDLC-2 are presented in this section.

Table A-13: Responses (downlink)

	Message Intent/Use	Message Element	URG	ALRT	RESP
0	The instruction is understood and will be complied with.	WILCO	N	M	N
1	The instruction cannot be complied with.	UNABLE	N	M	N
2	Wait for a reply.	STANDBY	N	M	N
3	Message received and understood.	ROGER	N	M	N
4	Yes.	AFFIRM	N	M	N
5	No.	NEGATIVE	N	M	N

Table A-14: Vertical Requests (downlink)

	Message Intent/Use	Message Element	URG	ALRT	RESP
6	Request to fly at the specified level.	REQUEST *(level)*	N	L	Y
9	Request to climb to the specified level.	REQUEST CLIMB TO *(level)*	N	L	Y
10	Request to descend to the specified level.	REQUEST DESCENT TO *(level)*	N	L	Y

Table A-15: Lateral Off-Set Requests (downlink)

	Message Intent/Use	Message Element	URG	ALRT	RESP
15	Request that a parallel track, offset from the cleared track by the specified distance in the specified direction, be approved.	REQUEST OFFSET *(specified distance) (direction)* OF ROUTE	N	L	Y
16	Request that a parallel track, offset from the cleared track by the specified distance in the specified direction, be approved from the specified position.	AT *(position)* REQUEST OFFSET *(specified distance) (direction)* OF ROUTE	N	L	Y

Table A-16: Speed Requests (downlink)

	Message Intent/Use	Message Element	URG	ALRT	RESP
18	Request to fly at the specified speed.	REQUEST *(speed)*	N	L	Y

Table A-17: Voice Contact Requests (downlink)

	Message Intent/Use	Message Element	URG	ALRT	RESP
20	Request for voice contact.	REQUEST VOICE CONTACT	N	L	Y
21	Request for voice contact on the specified frequency.	REQUEST VOICE CONTACT *(frequency)*	N	L	Y

Table A-18: Route Modification Requests (downlink)

	Message Intent/Use	Message Element	URG	ALRT	RESP
22	Request to track from the present position direct to the specified position.	REQUEST DIRECT TO *(position)*	N	L	Y
23	Request for the specified procedure clearance.	REQUEST *(procedure name)*	N	L	Y
24	Request for a route clearance.	REQUEST CLEARANCE *(route clearance)*	N	L	Y
25	Request for a clearance.	REQUEST *(clearance type)* CLEARANCE	N	L	Y
27	Request for a weather deviation up to the specified distance off track in the specified direction.	REQUEST WEATHER DEVIATION UP TO *(specified distance) (direction)* OF ROUTE	N	M	Y

Table A-19: Reports (downlink)

	Message Intent/Use	Message Element	URG	ALRT	RESP
28	Notification of leaving the specified level.	LEAVING *(level)*	N	L	N
31	Notification of passing the specified position.	PASSING *(position)*	N	L	N
78	Notification that at the specified time, the aircraft's position was as specified.	AT *(time) (distance) (to/from) (position)*	N	L	N
113	Notification of the requested speed.	*(speed type) (speed type) (speed type)* SPEED *(speed)*	N	L	N
37	Notification that the aircraft is maintaining the specified level.	MAINTAINING *(level)*	N	L	N
38	Read-back of the assigned level.	ASSIGNED LEVEL *(level)*	N	M	N
48	Position report.	POSITION REPORT *(position report)*	N	M	N
89	The specified ATS unit is being monitored on the specified frequency.	MONITORING *(unit name) (frequency)*	U	M	N
104	Notification of estimated time of arrival at the specified position	ETA *(position) (time)*	L	L	N
106	Notification of the preferred level.	PREFERRED LEVEL *(level)*	L	L	N
109	Notification of the preferred time to commence descent for approach.	TOP OF DESCENT *(time)*	L	L	N
110	Notification of the preferred position to commence descent for approach.	TOP OF DESCENT *(position)*	L	L	N

Note. Wherever the variable (level) is specified, the message can specify either a single level or a vertical range, i.e. block level.

Table A-21: Emergency and Urgent Messages (downlink)

	Message Intent/Use	Message Element	URG	ALRT	RESP
56	Distress prefix.	MAYDAY MAYDAY MAYDAY	D	H	Y

Table A-22: System Management Messages (downlink)

	Message Intent/Use	Message Element	URG	ALRT	RESP
62	A system generated message that the avionics has detected an error.	ERROR *(error information)*	U	L	N
63	A system generated denial to any CPDLC message sent from a ground facility that is not the current data authority.	NOT CURRENT DATA AUTHORITY	L	L	N
99	A system generated message to inform a ground facility that it is now the current data authority.	CURRENT DATA AUTHORITY	L	L	N
64	Notification to the ground system that the specified ATSU is the current data authority.	*(facility designation)*	L	L	N
107	A system generated message sent to a ground system that tries to connect to an aircraft when a current data authority has not designated the ground system as the NDA.	NOT AUTHORIZED NEXT DATA AUTHORITY	L	L	N
73	A system generated message indicating the software version number.	*(version number)*	L	L	N
100	Confirmation to the ground system that the aircraft system has received the message to which the logical acknowledgement refers and found it acceptable for display to the responsible person.	LOGICAL ACKNOWLEDGEMENT	N	M	N

Table A-24: Negotiation Responses (downlink)

	Message Intent/Use	Message Element	URG	ALRT	RESP
81	We can accept the specified level at the specified time.	WE CAN ACCEPT *(level)* AT *(time)*	L	L	N
82	We cannot accept the specified level.	WE CANNOT ACCEPT *(level)*	L	L	N

Note. Wherever the variable (level) is specified, the message can specify either a single level or a vertical range, i.e. block level.

- END -